

Effect of Environmental Factors on Electron Orbit Stability at PLS Storage Ring

C. W. Chung, Y. C. Kim, K. R. Kim, and M. H. Yoon

Pohang Accelerator Laboratory, POSTECH, Pohang, Korea, 790-784

Phone: +82 (54) 279-1008; Fax: +82(54) 279-1799

E-mail: cwchung@postech.edu

Abstract

The investigation on the stabilization of the electron beam orbit at PLS storage ring has been conducted to enhance ID beamline performance. The measurements such as the micro-scale displacements, the cooling air, and water temperatures were in particular focused on local sector #4 in the storage ring due to the experimental set-up scale limit at the beginning stage. Data collection was performed as real-time during normal user service beam operation to evaluate the environmental influences. As a result, it was found that there might be a strong correlation between the beam orbit stability and the mechanical behaviors of the magnets. Furthermore, during the beam injection period, it was analyzed that the ramping process caused the deformation of bending magnets with an order of tens of microns, in which the beam orbit drift occurred in the storage ring about one order higher in magnitude as compared with that of normal beam operation.

Keywords: deformation, orbit stability, storage ring

Presentation: Poster